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First Record of *Fittkauimyia* (Insecta: Diptera: Chironomidae) from the Palaearctic Region, with the Description of a New Species

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Fittkauimyia olivacea sp. nov. is described on the basis of the male and female adults, pupa, and fourth-instar larva. This is the first record of the genus *Fittkauimyia* from the Palaearctic Region.
Key Words: Chironomidae, Tanypodinae, *Fittkauimyia*, taxonomy, Japan.

Introduction

The genus *Fittkauimyia* hitherto comprises four described species: *F. disparipes* Karunakaran, 1969 from the Oriental and Australian Regions (Sublette and Sublette 1973; Roback 1982), *F. serta* (Roback 1971) from the Nearctic Region (Oliver *et al.* 1990; Epler 1995, 2001), *F. petersi* (Freeman, 1955) from the Ethiopian Region (Harrison 1978), and *F. crypta* Serrano and Nolte, 1996 from the Neotropical Region (Spies and Reiss 1996). The genus is, however, unknown from the Palaearctic Region.

Recently I discovered a new species of *Fittkauimyia* inhabiting slow streams in forests in Fukushima and Shizuoka Prefectures, Japan. This species is closely related to *F. crypta* but differs from it in having a setal fringe in the caudolateral corner of pupal segment III and five taeniate L-setae on each side of pupal segment VIII. I describe herein this new species on the basis of the male and female adults and their associated pupal and last larval exuviae.

The holotype and paratypes are deposited in the collection of the Shizuoka University Museum, Shizuoka, Japan.

The terminology and abbreviations for general morphology used in this paper follow Sæther (1980).

Taxonomy

Genus ***Fittkauimyia*** Karunakaran, 1969
[Japanese name: Nakazumenuma-yusurika zoku]

Fittkauimyia Karunakaran, 1969: 75.
Parapelopia Roback, 1971: 91. [Synonymized by Roback 1982]
Kamelopelopia Harrison, 1978: 65. [Synonymized by Fittkau and Roback 1983]
Type species: *Fittkauimyia disparipes* Karunakaran, 1969, by original designation.

Emended diagnosis. Generic diagnoses were given by Karunakaran (1969), Fittkau and Roback (1983), Fittkau and Murray (1986), Murray and Fittkau (1989), and Epler (1995, 2001). These diagnoses, however, should be emended for the Palaearctic species as follows:

Adult. Eye distinctly iridescent in some species. Antepronotum variously developed, with or without median notch. Female genitalia with weak gonocoxapodeme. Gonapophysis VIII rounded caudomesally. Gonapophysis IX well developed; notum longer than ramus. Rudiment of gonocoxite IX not apparent in dorsal view. Gonotergite IX without setae. Coxosternapodeme strong and curved. Segment X well developed, but without setae. Labium fringed with fine setae. Seminal capsule oval, with narrow neck region.

Pupa. Plastron plate of thoracic horn oval, 1.5–2.5 times as wide as high. Abdominal shagreen weak on anterior segments, more or less strong on posterior segments and consisting of solitary or grouped spinules. Abdominal segment I with 3–5 pairs of D-setae and 2 pairs of L-setae, these setae simple or taeniate. D_1-seta taeniate or spiniform on abdominal segment III, robust and spiniform on IV–VII; D_2- and D_3-setae taeniate, apically hooked and as long as or far longer than segment length on abdominal segments III and IV. Abdominal segments II–VII fringed laterally; lateral fringe consisting of 15–40 taeniate setae in basal 1/2–2/3 of segments II and III, 60–200 taeniate setae along entire margin of segments IV–VII. Occasionally abdominal segment III with posterolateral fringe of 10–15 taeniate setae. Abdominal segment VIII with 5–21 taeniate L-setae on each side.

Larva. Cephalic index 0.64–0.75. Basal segment of antenna 5.0–6.5 times as long as basal width. Basal segment of palp 2.0–3.5 times as long as basal width, with ring organ at base of distal 1/5–1/3.

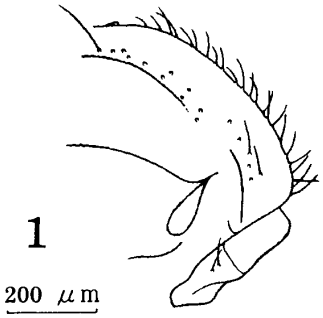
Remarks. *Fittkauimyia* belongs to the tribe Macropelopiini on account of the vein MCu beyond FCu and the costa produced beyond R_{4+5} on the adult wing, the flattened tibial spurs with a row of lateral teeth on the adult legs, the spiniform D_1-setae on the pupal abdominal segments, the pupal anal lobe with setal fringes along both inner and outer borders, the larval M-appendage with a pseudoradula, and the mesially joined dorsomental plates. However, it differs from the other genera of Macropelopiini in having spatulate and apically pectinate claws on the middle leg of the male adult, a perforate horn sac in the pupal thoracic horn, and sinuously arranged teeth on the larval dorsomentum. These features are unique among the genera of Tanypodinae as well.

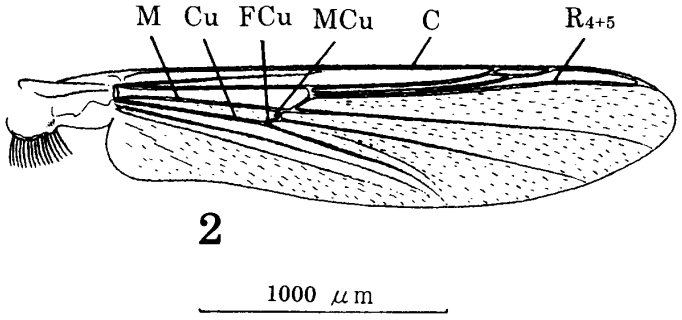
Fittkauimyia olivacea sp. nov.

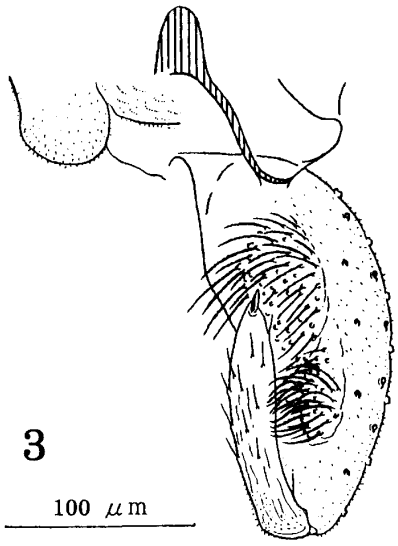
[Japanese name: Midori-nakazumenuma-yusurika]

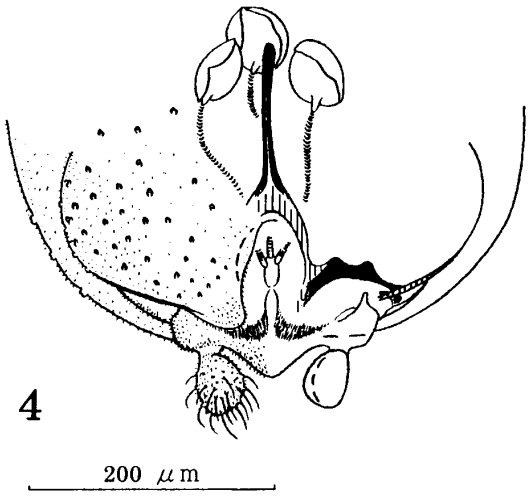
(Figs 1–15, Tables 1–3)

Type material. Holotype: SUM-IC-T001, ♂, emerged in laboratory on 26.VIII.2001 from sample of bottom sediment collected from upper reaches of Asami River in Hirono Town, Fukushima Prefecture (type locality 37°12′N, 140°48′E), 15.VIII. 2001, and mounted on a glass slide in Canada Balsam with the associated pupal exuviae. Paratypes: SUM-IC-T002, 1♀ with pupal exuviae from Ôpisa River, Iwaki City, Fukushima Prefecture, 15.VIII.1989 (adult emerged on 1.IX.1989); SUM-IC-T003, 1♂ with pupal and larval exuviae, from small stream in Miyaguchi,









Figs 1–4. Adults of *Fittkauimyia olivacea* sp. nov. 1–3, Male, holotype: 1, apex of thorax, lateral view; 2, wing; 3, hypopygium, dorsal view. 4, Female, paratype: 4, genitalia, ventral view. Abbreviations: C, costa; Cu, cubitus; FCu, fork of cubitus; M, media; MCu, cross vein between media and cubitus; R_{4+5}, branch of radius.

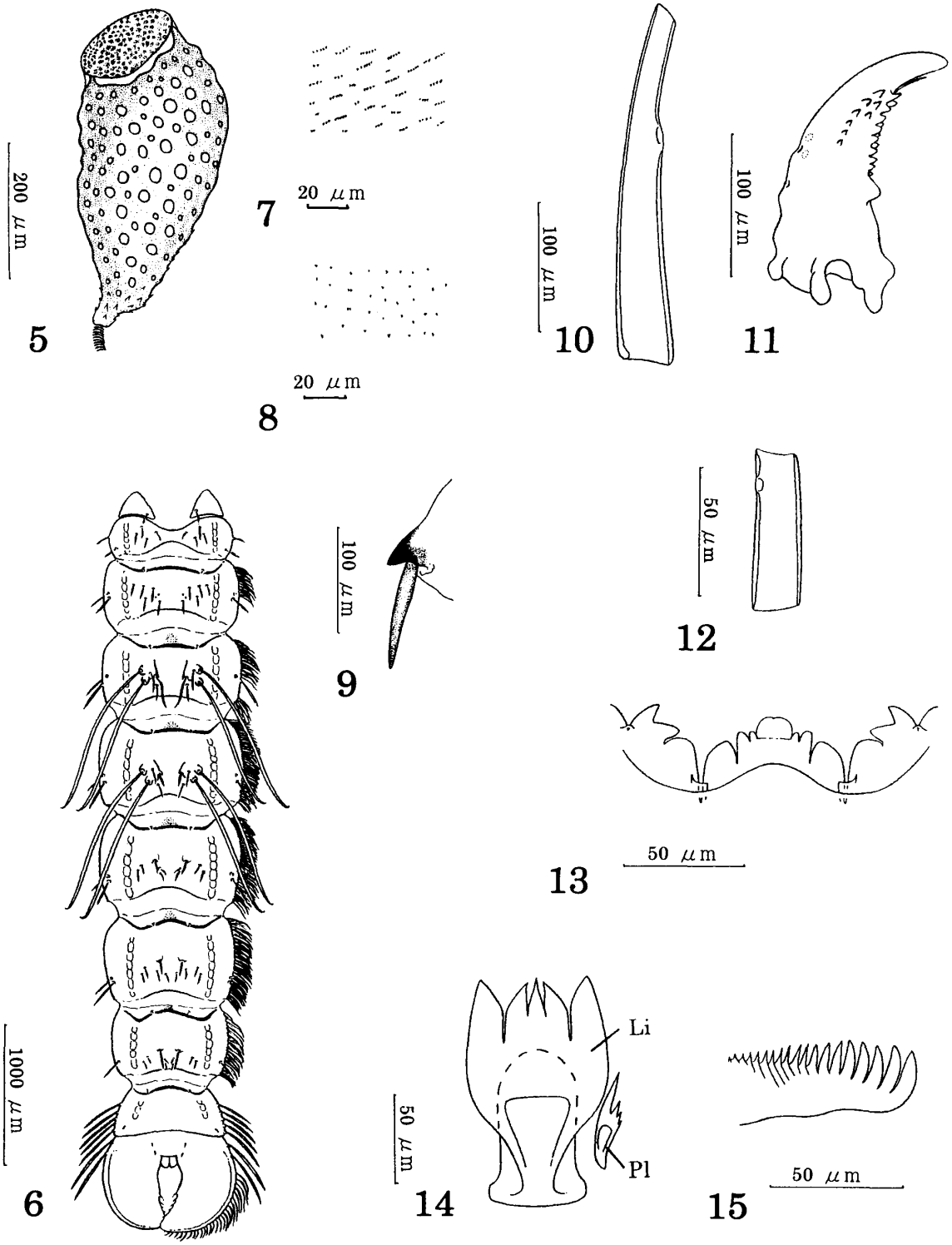
Hamakita City, Shizuoka Prefecture, 7.II.2004 (adult emerged on 25.II.2004).

Description. *Male* (*h*=measurement or count from holotype). Body length 4.4 (*h*)–5.0 mm. Wing length 2.7(*h*)–3.2 mm.

Coloration: Eye distinctly iridescent. Body predominantly olive-green; thorax pale brown on scutal vittae, anepisternum II, preepisternum, and postnotum; abdominal tergites II–VIII each with basal dark band, and hypopygium dark on gonocoxite. All legs predominantly pale brown; femur and tibia darkened apically.

Head: Temporals 20(*h*)–24, uniserial, partly bi- or triserial. Antenna with strong, 95 μm long subapical seta about as long as terminal flagellomere; antennal ratio 2.0–2.1(*h*). Clypeus rounded, with 23(*h*)–30 setae. Palpus with 5 segments; segment III semi-globose, with 12(*h*)–13 strong setae on inner border. Lengths of palpal segments in Table 1.

Thorax (Fig. 1): Antepronotum well developed, with broad median notch;



Figs 5–15. Immature forms of *Fittkauimyia olivacea* sp. nov. 5–9, Pupal exuviae, holotype: 5, thoracic horn; 6, abdomen, dorsal view, only right setal fringes shown; 7, shagreen spinules on tergite VIII; 8, shagreen spinules on anal lobe; 9, D_1-seta with basal tubercle on tergite IV. 10–15, Larval exuviae, paratype: 10, basal segment of antenna; 11, mandible; 12, basal segment of maxillary palp; 13, mentum; 14, ligula and paraligula, only right paraligula shown; 15, pecten hypopharyngis. Abbreviations: Li, ligula; Pl, paraligula.

Table 1. Lengths (μm) of palpal segments in *Fittkauimyia olivacea* sp. nov.

	n	Segment				
		I	II	III	IV	V
Male	2	45(*h*), 55	60(*h*), 65	75(*h*), 83	210(*h*), 250	295(*h*), 300
Female	1	55	65	80	215	280

Note: (*h*), measurement from holotype.

antepronotals 2(*h*)–3 on each side. Scutum with 6(*h*)–18 μm high tubercle. Acrostichals numbering 23(*h*)–26, biserial between median vittae; dorsocentrals 18(*h*)–19, biserial on each side; humerals 4–6(*h*), irregularly uniserial on each side; prealars 9(*h*)–12, uniserial, partly bi- or triserial; supraalars 1; anepisternals 1(*h*)–2. Scutellum with transverse row of 11 long posterior setae and group of 9(*h*)–10 short anterior setae. Postnotum with 3–4(*h*) dorsal setae. Wing (Fig. 2) with dense setae on membrane; length of Cu/length of M 0.86–0.87(*h*); squama fringed with 28(*h*)–33 setae. All legs with flattened tibial spurs; spur bearing 15–21 side teeth; hind leg with tibial comb of 13–14(*h*) spines. Tarsal beard short; bristle ratio 4.5–4.8(*h*) in foreleg, 3.8–4.8(*h*) in middle leg, 5.1–5.5(*h*) in hind leg. Claws with 1(*h*)–2 basoventral spines in middle leg; pulvilli large. Lengths and ratios of leg segments in Table 2.

Hypopygium (Fig. 3): Gonocoxite more or less cylindrical, 205(*h*)–235 μm long and 2.4–2.7(*h*) times as long as width at middle; dorsal swellings low and setigerous. Gonostylus 135(*h*)–163 μm long, somewhat parallel-sided and tapered at apex.

Female. Body length 2.8 mm. Wing length 2.6 mm.

Coloration: Similar to that of male.

Head: Temporals 20 in number. Antenna lost. Clypeus with 38 setae. Palpal segment III with 12 strong setae. Lengths of palpal segments in Table 1.

Thorax: Antepronotum with 4 lateral setae on each side. Scutal tubercle 13 μm high. Acrostichals numbering 28 between median vittae; dorsocentrals 19 on each side, humerals 7, prealars 13, supraalars 1, anepisternals 1. Scutellum with 13 long posterior setae and 16 short anterior setae. Postnotum with 5 dorsal setae. Wing with dense setae on membrane; length of Cu/length of M 0.85; squama fringed with 28 setae. All claws pointed apically, without basoventral spine. Lengths and ratios of leg segments in Table 3.

Genitalia (Fig. 4): Sternite VIII with about 130 setae. Gonapophysis IX well developed; notum 125 μm long.

Pupa. Body length 6.1–6.7 mm.

Coloration: Exuviae brown, with dark apophyses on abdomen.

Cephalothorax: Thoracic horn (Fig. 5) 440–556 μm long, 2.3–2.6 times as long as wide; plastron plate 1.9–2.3 times as wide as high and occupying apical 1/10–1/7 of thoracic horn.

Abdomen (Fig. 6): Shagreen distinct on posterior segments, mainly consisting of serial rows of several pointed spinules each on tergites VI–VIII (Fig. 7), of solitary spinules on anal lobe (Fig. 8). Tergite I with 4 pairs of D-setae, tergite II with 5 pairs of D-setae, these setae short and taeniate. D_1-seta somewhat taeniate on tergite III, sclerotized and spiniform on tergites IV–VII, all arising from more or

Table 2. Lengths (μm) and ratios of leg segments in two males of *Fittkauimyia olivacea* sp. nov.

	Coxa	Trochanter	Femur	Tibia	Tarsomere 1
Foreleg	228(*h*), 279	178(*h*), 228	1218(*h*), 1345	1548(*h*), 1599	1599(*h*), 1726
Middle leg	381(*h*), 457	152(*h*), 178	1624(*h*), 1726	1497(*h*), 1650	1599(*h*), 1751
Hind leg	305(*h*), 355	127(*h*), 178	1447(*h*), 1624	1827(*h*), 2030	1574(*h*), 1954

	Tarsomere 2	Tarsomere 3	Tarsomere 4	Tarsomere 5	Leg ratio
Foreleg	660(*h*), 685	546(*h*), 584	355(*h*), 381	114(*h*), 140	1.03(*h*), 1.08
Middle leg	635(*h*), 685	381(*h*), 406	228(*h*), 254	114(*h*), 140	1.07(*h*), 1.06
Hind leg	584(*h*), 647	457(*h*), 533	355(*h*), 381	127(*h*), 140	0.86(*h*), 0.96

Note: (*h*), measurement from holotype; leg ratio, ratio of length of tarsomere 1 to length of tibia.

less distinct tubercle; basal tubercle of D_1-seta large and with sclerotized beak on tergites III and IV (Fig. 9); D_1-seta positioned 0.55–0.63 of way from base on tergite V, 0.56–0.64 on tergite VI, 0.58–0.65 on tergite VII. D_2- and D_3-setae very long, about 1.5 times as long as segment length and arising from large tubercles on tergites III and IV, short and arising from minute tubercles on tergites V–VII, all taeniate. D_4- and D_5-setae short and taeniate on tergites III–VII. Segments I–VI with 2 pairs of taeniate L-setae, segment VII with 1 pair of taeniate L-setae, segment VIII with 5 pairs of taeniate L-setae. Lateral fringe consisting of 28–54 setae in basal 1/2 of segments II and III, about 60–200 setae along each entire margin of segments IV–VII; segment III with additional fringe of 11–14 setae in posterolateral corner. Anal lobe 727–859 μm long and 1.7–1.9 times as long as broad; posterior anal macroseta positioned 0.18–0.24 of way from base. Male genital sac 0.42–0.48 times as long as anal lobe length.

Fourth instar larva. Head capsule length 949 μm.

Head: Cephalic index 0.72. Lengths of antennal segments I and II 270 and 29 μm, respectively; apical antennal segments broken off. Antennal segment I (Fig. 10) 6.4 times as long as basal width, with ring organ positioned 0.63 of way from base. Antennal segment II about 5.8 times as long as broad. Mandible (Fig. 11) 193 μm

Table 3. Lengths (μm) and ratios of leg segments in one female of *Fittkauimyia olivacea* sp. nov.

	Coxa	Trochanter	Femur	Tibia	Tarsomere 1
Foreleg	279	178	1218	1624	1497
Middle leg	432	152	1624	1624	1624
Hind leg	330	152	1497	1827	1548

	Tarsomere 2	Tarsomere 3	Tarsomere 4	Tarsomere 5	Leg ratio
Foreleg	635	508	305	127	0.92
Middle leg	609	355	228	127	1.00
Hind leg	584	482	355	127	0.85

Note: leg ratio, ratio of length of tarsomere 1 to length of tibia.

long, with large apical tooth and many small teeth; small teeth numbering 8 ventrally and 16 including basal tooth along inner margin of mandible. Basal segment of maxillary palp (Fig. 12) 65 μm long, 3.3 times as long as basal width; ring organ positioned 0.8 of way from base. Dorsomentum (Fig. 13) subdivided into 3 plates; median plate with 7 teeth, each lateral plate with 2 teeth; middle tooth on median plate hyaline, outermost tooth on lateral plate bifid apically; dorsomental teeth arranged sinuously. Ligula (Fig. 14) 128 μm long, 1.8 times as long as maximum width; row of teeth forming almost straight line at apex; inner teeth distinctly turning inwards. Paraligula 55 μm long, with main tooth and 3 small teeth. Pecten hypopharyngis (Fig. 15) with about 20 teeth.

Abdomen lost.

Distribution. Japan (Fukushima and Shizuoka Prefectures).

Etymology. From the Latin *olivaceus* (olive-green), referring to the body coloration of the adult.

Remarks. This new species seems closely related to the Neotropical *Fittkauimyia crypta* in that both have a distinctly iridescent eye and a well-developed antepronotum with a median notch in the adult, which are unusual features among the known species of *Fittkauimyia*. The new species differs from the latter in having an additional setal fringe in the caudolateral corner of the pupal segment III and five taeniate L-setae on each side of the pupal segment VIII. According to Serrano and Nolte (1996), the pupa of *F. crypta* has no setal fringe in the caudolateral corner of segment III and 16–21 taeniate L-setae on each side of the segment VIII.

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